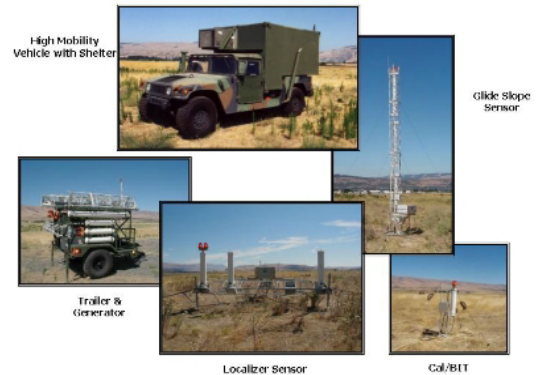


## Transportable Transponder Landing System (TTLS)

**Purpose:** To provide a rapidly deployable (HMMWV mounted or smaller), all weather, precision, non-emitting, air traffic control terminal.

**Background:** TTLS was originally developed under a Defense Advanced Research Projects Agency effort through NAVAIR and Advanced Navigation and Positioning Corporation. The system was designed to provide a precision approach capability by using inexpensive ground systems to provide position information for aircraft equipped with a transponder and standard Federal Aviation Administration Category I Instrument Landing System (ILS) equipment. During April 2001, the Marine Air Board identified a requirement for a non-emitting precision approach landing capability more robust than the initial TTLS, that included multiple aircraft tracking and guidance; a miniaturization of the system for mounting on a supporting ground vehicle; and reciprocal approaches/runway support. Congress appropriated funds in FY04 to explore TTLS technology to determine if it has the potential to fulfill the Marine Corps requirements. These funds were focused on refining the system design, system miniaturization, and system testing. FY06 funds were used to make improvements in software and hardware, and conduct an interoperability demonstration.



**Description:** TTLS is a combined effort between NAVAIR PMA 213, MCWL, and HQMC (Aviation) APC-5. APC serves as the lead agency in this proof of concept. The Lab, in conjunction with NAVAIR and HQMC (Aviation), will assess the TTLS's ability to perform: multiple aircraft tracking, 360-degree surveillance, and primary and reciprocal runway approach guidance. Following the assessment, HQMC (Aviation) will determine suitability of TTLS for Marine Corps employment and acquisition. The system hardware includes: time and angle-of-arrival sensors; an interrogator; and an uplink antenna. No new equipment is required onboard aircraft. The prototype Rhino II TTLS can be packed into a single C-130 aircraft, driven off and rapidly employed (setup within six hours) to provide Category I guidance to both military and civilian aircraft. In addition to the ILS-emulation capability, the TTLS also presents a precision approach radar (PAR) display to the operator enabling ground-controlled approaches (GCA). It tracks aircraft out to 20 nautical miles up to 10,000 feet. With a single system, pilots can be guided to safe landings whether or not they are ILS-capable.

**Deliverable Product(s):** Assessment reports, requirements documentation, interrogation trade study, equipment (Rhino II prototype system with miniaturized computer components), flight demonstration, and testing.

**Milestones:**

TASK	FY06
Software complete	▲
Sub-system and System Integration Test	▲

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